CLAIMS

1. A particulate porous ammoxidation catalyst for use in producing acrylonitrile or methacrylonitrile by reacting propylene, isobutene or tert-butyl alcohol with molecular oxygen and ammonia in a fluidized-bed reactor,

said catalyst comprising a metal oxide and a silica carrier having supported thereon said metal oxide, wherein said silica carrier is present in an amount of from 20 to 80 % by weight, based on the total weight of said metal oxide and said silica carrier and wherein said metal oxide contains at least two elements selected from the group consisting of molybdenum, bismuth, iron, vanadium, antimony, tellurium and niobium,

said catalyst having a particle diameter distribution wherein the amount of catalyst particles having a particle diameter of from 5 to 200 μm is from 90 to 100 % by weight, based on the weight of said catalyst, and

said catalyst having a pore distribution wherein the cumulative pore volume of pores having a pore diameter of 80 Å or less is not more than 20 %, based on the total pore volume of said catalyst, and the cumulative pore volume of pores having a pore diameter of 1,000 Å or more is not more than 20 %, based on the to-

tal pore volume of said catalyst.

2. The particulate porous ammoxidation catalyst according to claim 1, wherein said metal oxide is represented by the following formula (1):

$$Mo_{12}Bi_aFe_bC_cD_dE_eF_fG_gO_n \qquad (1)$$

wherein:

C is at least one element selected from the group consisting of nickel, cobalt, manganese, zinc, magnesium, calcium, strontium and barium;

D is at least one element selected from the group consisting of chromium, tungsten, vanadium, niobium, boron, aluminum, gallium, indium, phosphorus, antimony and tellurium;

E is at least one element selected from the group consisting of rare earth elements;

F is at least one element selected from the group consisting of ruthenium, rhodium, palladium, osmium, iridium and platinum;

G is at least one element selected from the group consisting of sodium, potassium, rubidium and cesium; and

a, b, c, d, e, f, g and n are, respectively, the

atomic ratios of bismuth (Bi), iron (Fe), C, D, E, F, G and oxygen (O), relative to 12 atoms of molybdenum (Mo),

wherein:

a is from 0.05 to 7,

b is from 0.1 to 7,

c is from 0 to 12,

d is from 0 to 5,

e is from 0 to 5,

f is from 0 to 0.2,

g is from 0.01 to 5, and

n is the number of oxygen atoms required to satisfy the valence requirements of the other component elements present.

3. The particulate porous ammoxidation catalyst according to claim 1 or 2, wherein said silica carrier is produced from a silica raw material comprising 40 to 100 % by weight of (i) at least one silica sol having an average primary silica particle diameter of from 20 to 100 nm and 60 to 0 % by weight of (ii) at least one silica sol having an average primary silica particle diameter of from 5 nm to less than 20 nm, wherein the total weight of said at least one silica sol (i) and said at least one silica sol (ii) is 100 % by weight,

each % by weight of a silica sol being expressed in terms of the weight of silica contained in the silica sol.

4. A method for producing the catalyst of claim 1, which comprises:

providing an aqueous raw material mixture containing compounds of at least two elements selected from the group consisting of molybdenum, bismuth, iron, vanadium, antimony, tellurium and niobium and containing a silica raw material,

said silica raw material comprising 40 to 100 % by weight of (i) at least one silica sol having an average primary silica particle diameter of from 20 to 100 nm and 60 to 0 % by weight of (ii) at least one silica sol having an average primary silica particle diameter of from 5 nm to less than 20 nm, wherein the total weight of said at least one silica sol (i) and said at least one silica sol (ii) is 100 % by weight, each % by weight of a silica sol being expressed in terms of the weight of silica contained in the silica sol,

spray drying said aqueous raw material mixture to thereby obtain a dried catalyst precursor, and

calcining said dried catalyst precursor, thereby obtaining the catalyst of claim 1.

5. The method according to claim 4, wherein said calcination comprises a preliminary calcination and a final calcination, wherein said preliminary calcination is performed at a temperature in the range of from 150 to 430 °C and said final calcination is performed at a temperature in the range of from 450 to 750 °C.

6. A method for producing acrylonitrile or methacrylonitrile, comprising reacting propylene, isobutene or tert-butyl alcohol with molecular oxygen and ammonia in a fluidized-bed reactor using the catalyst of any one of claims 1 to 3.

7. A method for producing acrylonitrile or methacrylonitrile, comprising reacting propylene, isobutene or tert-butyl alcohol with molecular oxygen and ammonia in a fluidized-bed reactor using the catalyst produced by the method of claim 4 or 5.